

an input and output unit including a display unit configured to display input prompts for selecting a comfort setting using the control unit, the display unit configured to display at least one of operational settings and control elements relative to selected comfort settings in a context-sensitive and preference-sensitive matter;

wherein the control unit is configured to execute input control commands for the at least one of the operational settings and the control elements.

19 17. (New) The device according to claim 18, wherein the control unit is connected to at least one other control unit of the motor vehicle by a CAN bus.

20 18. (New) The device according to claim 18, wherein the display unit includes a touch screen.

21 19. (New) The device according to claim 18, wherein the input and output unit includes an input device, the input device including at least one of a voice-recognition unit and a bidirectional, rotary pressure transducer.--.

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Completed

### REMARKS

This Preliminary Amendment cancels, without prejudice, claims 1 to 10 in the underlying PCT Application No. PCT/EP00/08250. This Preliminary Amendment further cancels, without prejudice, claims 1 to 8 in the annex to the International Preliminary Examination Report and adds new claims 9 to 19. The new claims, inter alia, conform the claims to U.S. Patent and Trademark Office rules and does not add any new matter to the application.

In accordance with 37 C.F.R. § 1.121(b)(3), the Substitute Specification (including the Abstract, but without the claims) contains no new matter. The amendments reflected in the Substitute Specification (including Abstract) are to conform the Specification and Abstract to U.S. Patent and Trademark Office rules or to correct informalities. As required by 37 C.F.R. §§ 1.121(b)(3)(iii) and 1.125(b)(2), a Marked Up Version of the Substitute Specification comparing the Specification of record and the Substitute Specification also accompanies this Preliminary Amendment. Approval and entry of the Substitute Specification (including Abstract) is respectfully requested.

The underlying PCT Application No. PCT/EP00/08250 includes an International Search Report, dated November 2, 2000, a copy of which is included. The Search Report includes a list of documents that were considered by the Examiner in the underlying PCT application.

The underlying PCT Application No. PCT/EP00/08250 also includes an International Preliminary Examination Report, dated December 21, 2001. An English translation of the International Preliminary Examination Report and annex thereto is included herewith.

It is respectfully submitted that the subject matter of the present application is new, non-obvious and useful. Prompt consideration and allowance of the application are respectfully requested.

Respectfully submitted,

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[11150/45]

METHOD AND DEVICE FOR ACTIVELY ASSISTING A  
MOTOR VEHICLE DRIVER IN A MOTOR VEHICLE

FIELD OF THE INVENTION

The present invention relates to a method and a device for implementing the method of actively assisting a motor vehicle driver in a motor vehicle.

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BACKGROUND INFORMATION

Motor vehicles represent an overall system, which is becoming increasingly complex and, on one hand, offers a motor vehicle driver more and more comfort options and, on the other hand, is provided with an increasing number of safety-related systems. However, these safety-related systems must be monitored with regard to their functionality. In the case of a defect or a condition that is critical for the vehicle, a motor vehicle driver often does not know how he or she should react to such an error message indicated, for example, by a lit-up LED. In addition, it is difficult for most motor vehicle drivers to remember how to correctly operate all of the comfort systems, such as navigation, engine-independent heating systems, air conditioning, seat adjusters, mirror adjusting systems, telephone, audio, etc. This results in a multitude of comfort options, which would otherwise be used, not being used at all. In addition, the existing displays only show the motor vehicle driver the actual states, such as "the tank is empty", "inspection interval elapsed", or "for safety reasons, television only during standstill".

Therefore, it is an object of the present invention [is based on the engineering problem of providing] to provide a method and a device for actively assisting a motor vehicle driver in a motor vehicle, which prevent the problems described above.

[The solution to the engineering problem is given by the subject matters having the features of Claims 1 and 6. Additional advantageous embodiments of the present invention are derived from the dependent claims.]

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#### SUMMARY

To this end, the control unit and an input and display unit automatically assist in the communication between the motor vehicle driver and the vehicle. In order to assist the motor vehicle driver, he or she is offered context- and/or preference-sensitive input options, which are automatically implemented after being selected by the motor vehicle driver.

In [a preferred] an example embodiment of the present invention, a control unit monitors the conditions of the vehicle and displays these on a display unit, together with possible actions. The action selected by the motor vehicle driver is then automatically executed by the device. If the control unit detects, for example, that the engine temperature has exceeded its permissible value, then this is automatically represented on the display unit. In addition, the possible actions such as "shut off engine", "call nearest garage", or "ignore" are represented on the display unit. If the motor vehicle driver selects the action "shut off engine", then the device automatically switches off the engine. If, however, the motor vehicle driver selects the action "call nearest garage", then the device uses the data of a navigation device to search for the next service station, and uses a car-phone system to automatically dial the number of the service station. Therefore, the method is not only used to display the critical conditions to the motor vehicle driver, but also to display the appropriate countermeasures, which are then actively supported, as well. To this end, the individual countermeasures [are preferably] may be stored in a situation-specific manner in a memory assigned to the control unit.

Examples of other critical vehicle conditions include the engine-oil level.

5 The motor vehicle driver may also be actively assisted in the adjustment of comfort components. For this purpose, the control unit is connected to the corresponding comfort devices. After the motor vehicle driver has manually activated the method, the possible comfort systems are initially represented on the display unit, from which the  
10 motor vehicle driver [can] may then select the desired comfort components. In addition, it should be noted that, in this case, manual activation is to be understood as the opposite of automatic activation and therefore includes activation by voice command, as well. After the motor vehicle driver has  
15 selected the desired comfort components, the display unit displays which changes [can] may be made and how they [can] may be [carried out] performed. In this context, the display occurs in a context-sensitive manner, i.e., only information relevant for the adjustments is displayed.

20 If the display unit is [designed] configured as a touch screen, then the corresponding control elements [can] may be ordered in a context-sensitive manner and displayed on the display unit.

25 The motor vehicle driver [can] may receive further, active assistance from recommendations such as eating, resting, refueling, parking, or spending the night. To this end, the motor vehicle driver manually activates the method again and  
30 selects from a suggestion list the recommendations he would like to receive. Access to the data of a navigation system allows a list of possible suggestions to be compiled, driver preferences possibly being considered. In the individual recommendations, the motor vehicle driver [can] may have  
35 details displayed for him and, after selecting a recommendation, he [can] may be navigated to what is

recommended or make an order, in which case the number may be automatically dialed.

[Of course, the] The individual methods [can] may also be  
5 combined, i.e., one [can] may simultaneously intervene in  
comfort components and vehicle-condition components. If, for  
example, the motor vehicle driver selects a television mounted  
in the vehicle, while driving, then the driver is informed, on  
one hand, that this is not permissible while driving. In  
10 addition, the warning is immediately followed by an inquiry as  
to whether a possibility for parking [should] may be sought  
after. If the motor vehicle driver answers this in the  
affirmative, then the system searches for the next parking  
possibility with the aid of a navigation system, and navigates  
15 the motor vehicle driver to it. Preparatory adjustments, such  
as the selection of a station, [can] may already be checked  
and [carried out] performed parallelly to navigating. If the  
motor vehicle was navigated to the parking spot, the motor  
vehicle driver is asked if the engine [should] may be shut  
20 off, which may then be automatically executed by the system.

The present invention is explained below in detail, using [a  
preferred exemplary] an example embodiment. [The figures  
show:]

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic view of a display on a display unit,  
after the method has been activated[;].

Fig. 2 is a schematic view of a display on the display unit,  
after the driver has input a request for recommendations[;].

Fig. 3 is a schematic view of a display of a hit list[;].

Fig. 4 is a schematic view of a detailed display of a hit[;].

Fig. 5 is a schematic view of a display of the hits on a digital map[; and].

Fig. 6 is a schematic view of a display of an automatically displayed, critical vehicle condition.

#### DETAILED DESCRIPTION

The method for actively assisting a motor vehicle driver in a motor vehicle is assigned an activation field 1, which [is always situated] may be arranged at the same position on display unit 5, which takes the form of a touch screen. If this activation field 1 is activated, then a control unit [not shown] changes the current display on display unit 5 and generates a first input menu 6 on display unit 5. This input menu 6 includes a marking indicating that the method is activated, in which the name of the function, for example "BUTLER", is made visible, the upper edge of input menu 6 also being rounded off. Furthermore, input menu 6 includes three input fields 2, on which the selection options are alphanumerically displayed. In this context, the user may select among the input options "recommendations", "help", and "repeat status message", input fields 2 being [designed] configured as touch fields. Alternatively, or in addition, the input may be accomplished by voice command and/or using a bidirectional, rotary pressure transducer, which, for example, is described in [EP] European Published Patent Application No. 0 366 132 [B1]. If input option 2a, "recommendations", is [now] selected, the control unit generates a display [according to] illustrated in Fig. 2.

In this case, input menu 6 [from] illustrated in Fig. 1 has been moved up on display unit 5. A menu 7 of the areas, for which the method [can] may give the user recommendations, in this case "eating", "resting", "refueling", "parking", and "lodging", is then displayed under the input menu. The fields

of menu 7 are [designed] configured as touch fields, as are  
input fields 2. If the user now selects the field, "eating",  
this field 7a is [then] displayed in color or in an optically  
highlighted manner. In addition, the selected field is  
5 assigned a touch-sensitive input field 8, "open", by [means  
of] which detailed information is displayable. However, the  
user [can] may change to another field or another input option  
by touch, or discontinue the method by touching "closing  
field" 3. After input field 8, "open", is touched, the  
10 control unit generates a suggestion list 9, which is  
[displayed] illustrated in Fig. 3. To generate this  
suggestion list 9, the control unit accesses the database of a  
navigation system, in order to determine the current position  
of the motor vehicle. Using this current position as a  
15 starting point, the control unit searches through an internal  
and/or external restaurant database. In this context, the  
control unit selects restaurants located within a certain area  
around the current position, additional driver preferences,  
such as "no Japanese food", being considered. If the user  
20 would [now] like to obtain details on a restaurant, this  
restaurant is selected in suggestion list 9, and inserted  
field 10, "detail", is activated. An [exemplary] example  
detailed display is [represented] illustrated in Fig. 4. If  
desired, the user [can] may have the menu read out by  
25 activating input field 11, "read out". The activation of  
input field 4 automatically establishes a telephone connection  
to the restaurant, in order, for example, to reserve a table.  
But if the user would like to receive data for navigating to  
the restaurant, then, by activating input field 12,  
30 "navigation", a digital map 13 having route guidance is  
displayed on display unit 5 as illustrated in [accordance  
with] Fig. 5, and/or the guidance system is activated.

[Represented] Illustrated in Fig. 6 is a display of an  
35 automatically displayed warning message 14 for a critical  
condition of the vehicle. The example [represented here]

illustrated is the increased temperature of the engine oil.

To this end, the control unit or sensory system responsible for the engine-oil temperature transmits a warning message to the control unit controlling display unit 5. As a result, the

5 control unit generates a corresponding warning message 14 and displays it on display unit 5 in an optically highlighted manner. In order to perceive it in an improved manner, the warning message may be emphasized in color and/or using

10 additional pictographs. Furthermore, additional acoustic and/or haptic warning instructions are also possible. At the same time, the control unit activates the method for active

assistance, so that input menu 6 is automatically displayed with assigned input fields 2. Possibilities for action, such

as how one [could] may react to the represented, critical

15 vehicle condition, are offered to the driver on these input fields 2. In this case, the motor vehicle driver [can] may

select among the options "shut off engine", "call garage", or "ignore". If the motor vehicle driver selects input field 2, "shut off engine", then the control unit automatically

20 switches off the engine. In so doing, the event may be delayed in time, in order that the motor vehicle driver is able to shut off the motor vehicle at a suitable location.

However, if the motor vehicle driver selects input field 2, "call garage", then the control unit automatically calls the

25 nearest garage. When input field 2, "ignore", is selected, warning message 14 is erased accordingly.

**ABSTRACT**

In a method and device for actively assisting a vehicle driver in a motor vehicle by at least one control device and a data entry and display unit, the control device may access data of vehicle state-relevant sensors and of control devices and/or comfort control devices and/or internal or external databases.

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